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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/589,841	06/08/2000	Warren M. Farnworth	3923US (99-0033)	1415

7590 12/04/2002

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EXAMINER

LEE, GRANVILL D

ART UNIT	PAPER NUMBER
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2825

DATE MAILED: 12/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/589,841

Applicant(s)

FARNWORTH ET AL.

Examiner

Granvill D Lee, Jr

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 and 52-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-37 and 52-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 13. 6) ☐ Other: _____

DETAILED ACTION

Response to Applicant's Argument

After review of applicant's amendments and comments, the examiner finds such arguments unpersuasive. Applicant's comments as to Grigg et al. are well taken, however in further review of the prior art, the examiner has found that Lake read upon applicant's claimed invention. As these are a new grounds for rejection, but the following rejections are not to be considered final.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-37 and 52-56 are rejected under 35 U.S.C. 102(a) as being anticipated by Lake (US. Pat. 5,987,739).

In view of these claims, Lake discloses a method of fabricating a protective layer (Fig. 8 #96) on a semiconductor device, comprising: providing at least one semiconductor die (Fig. 6 #20) having an active surface with at least one bond pad (Col. 4 lines 33-36) exposed thereover; selecting at least one

portion of said active surface to be covered with at least a first layer of a protective material (Fig. 8 #96); forming said at least a first layer with said protective in an unconsolidated state (Col. 5 lines 25-45) at least over said at least one portion; and selectively altering the state of said first layer of protective material over at least a portion of said at least one portion from said unconsolidated state to at least a semisolid state (Col. 5 lines 25-45), while leaving protective material over other portions of said active surface in said unconsolidated state.

In view of claim 2, Lake forms a first layer of said protective material (Fig. 8 #96) in said unconsolidated state comprises forming said at least a first layer with said protective material being in a liquid state (Col. 5 lines 25-45).

In view of claim 3, Lake forms a first layer comprises forming said at least a first layer of protective material (Fig. 8 #96) in said unconsolidated state to have a thickness substantially the same as a desired thickness of said protective material in said at least a semisolid (Col. 5 lines 25-45) state over said at least one portion.

In view of claim 4, Lake selectively altering comprises directing a controlled, discrete beam of radiation (Abstr.) onto said protective material located over said at least one portion.

In view of claim 5, Lake directs a controlled, discrete beam of focused ultraviolet laser radiation (Abstr.).

In view of claim 6, Lake forms a least said first layer comprises forming said at least said first layer from a liquid resin controllably curable to a solid state (Col. 5 lines 25-45).

In view of claim 7, Lake forms a wafer (Fig. 1 #14) having a plurality of semiconductor dice (Fig. 6 #6).

In view of claim 8, Lake forms a least one second portion of said active surface covered with said at least a first layer of protective material (Fig. 2 #30) to be covered with a second layer of protective material (Col. 6 lines 30-40), said at least one second portion being superimposed, contiguous with, and mutually adhered to said at least one portion of said at least a first layer; forming said second layer with said protective material in an unconsolidated state over at least said at least one second portion of said active surface; and selectively altering the state of said second layer of protective material over at least a portion of said at least one second portion from said unconsolidated state to at least a semisolid state while leaving some protective material of said second layer over other regions of said active surface in said unconsolidated state (Col. 5 lines 25-45).

In view of claim 9, Lake forms a protective material (Fig. 8 #96) in said unconsolidated state (Col. 5 lines 25-45) from said at least one semiconductor die (Fig. 6 #6).

In view of claim 10, Lake forms a protective material (Fig. 8 #96) in semisolid state over at least one semiconductor die (Fig. 6 #6) to a substantially full cure (Col. 5 lines 25-45).

In view of claim 11, Lake forms a protective material over said at least one bond pad in said unconsolidated state (Col. 5 lines 25-45).

In view of claim 12, Lake forms a layer of protective material on a specified area on an active surface of one or more selected dice of a plurality of semiconductor dice of a wafer (Fig. 2 #16), comprising: selecting at least one portion of said active surface of each of the selected dice to be covered with the layer of protective material; forming at least one layer of protective material in an unconsolidated state over at least said at least one portion of the active surface; and selectively altering the state of said protective material (Fig. 8 #96) of said at least one layer of protective material over at least a portion of said at least one portion of the active surface to at least a semisolid state, while leaving the protective material over other regions of the active surface in a substantially unconsolidated state (Col. 5 lines 25-45).

In view of claim 13, Lake forms a at least one second portion of said active surface at least partially overlying said at least one portion of said at least one layer of protective material (Fig. 8 #96) to be covered with a second layer of protective material (Col. 6 lines 30-50); forming said second layer with said protective material in an unconsolidated state over at least one second portion; and selectively altering the state of the protective material of said

second layer (Col. 6 lines 30-40) over at least a portion of said at least one second portion from said unconsolidated state to an at least semisolid state, said at least one second portion being superimposed over, contiguous with, and mutually adhered to said at least one portion of said at least one layer of protective material, while leaving protective material (Fig. 8 #96) of said second layer over other regions of the active surfaces in said unconsolidated state (Col. 5 lines 25-45).

In view of claim 14, Lake forms at least some of the protective material in said unconsolidated state from said active surface (Col. 5 lines 25-45).

In view of claim 15, Lake forms a protective material in said at least semisolid state to a secondary curing for further solidifying the protective material (Col. 5 lines 25-45).

In view of claim 16, Lake forms a singulating (Col. 5 lines 50-60) at least the selected dice from the wafer.

In view of claim 17, Lake forms a singulating (Col. 5 lines 50-60) at least the selected dice from the wafer.

In view of claim 18, Lake forms a singulating is effected before said secondary curing (Col. 5 lines 25-45).

In view of claim 19, Lake forms a singulating (Col. 5 lines 50-60) is effected after said secondary curing.

In view of claim 20, Lake forms a protective material overlying regions of the wafer lying between adjacent ones of the selected dice in said unconsolidated state (Col. 5 lines 25-45).

In view of claim 21, Lake forms a least one layer of protective material comprises substantially completely covering the wafer with the protective material (Fig. 8 #96) in said unconsolidated state.

In view of claim 22, Lake forms a protective material over bond pads (Col. 4 lines 33-36) of the selected dice in said unconsolidated state (Col. 5 lines 25-45).

In view of claim 23, Lake forms selectively altering at least a portion of said at least one portion to a beam of radiation (Abstr.).

In view of claim 24, Lake forms a protective layer (Fig. 8 #96) on a selected portion of a surface of a semiconductor die, comprising: providing the semiconductor die (Fig. 6 #6) with an active surface thereof being attached to a lead frame of a lead frame strip; supporting the semiconductor die on a platform with a back side of the semiconductor die being placed on said platform; submerging at least the semiconductor die (Fig. 6 #6) in liquid resin to form a layer of said liquid resin over said active surface; and subjecting selected portions of said layer to a controllable beam of radiation (Abstr.) to change said liquid resin in said selected portions to an at least semisolid state (Col. 5 lines 25-45).

In view of claim 25, Lake forms a layer by subjecting selected portions to a beam of UV radiation (Abstr.).

In view of claim 26, Lake stores data including at least one physical parameter of the semiconductor die in computer memory and using the stored data in conjunction with a machine vision system to recognize the location and orientation of the semiconductor die and said selected portion (Col. 11 lines 55-65).

In view of claim 27, Lake stores data, in conjunction with the machine vision system, to selectively form said layer of resin stereolithographically over said selected portion of said semiconductor die (Col. 11 lines 55-65).

In view of claim 28, Lake forms a subjecting portions of said layer other than at locations of leads of the lead frame to said controllable beam of radiation (Abstr.).

In view of claim 29, Lake forms a layer with at least a portion thereof underlying a lead of the lead frame.

In view of claim 30, Lake forms a protective layer in said semisolid state from said active surface.

In view of claim 31, Lake forms a protective layer (Fig. 8 #96) in said semisolid state to a secondary curing.

In view of claim 32, Lake forms a curing comprises increasing a temperature of said protective layer.

In view of claim 33, Lake forms a protective layer on a selected portion of an active surface of a semiconductor dice of a wafer (Fig. 2 #14), comprising: securing the wafer to a platform; recognizing a location and orientation of at least one selected die of the wafer and bond pads (Col. 4 lines 33-36) on the active surface of said at least one selected die; submerging said platform in a liquid resin to a controlled liquid depth at least over at least a portion of said active surface of said at least one selected die; and subjecting at least one selected portion of said liquid resin over said active surface of said at least one selected die to a discrete beam of focused radiation (Abstr.) to alter said liquid resin in said at least one selected portion to at least a semisolid state (Col. 5 lines 25-45) and form a layer of semisolid material adhered to said active surface.

In view of claim 34, Lake forms a stores data including at least one physical parameter of said at least one selected die of the wafer, in computer memory, and using the stored data in cooperation with a machine vision system to recognize the location and orientation (Col. 11 lines 55-65) of said at least one selected die, and to control a path of said discrete beam of focused radiation to stereolithographically form said layer of semisolid material (Col. 5 lines 25-45).

In view of claim 35, Lake stores data comprises merging said data (Col. 11 lines 55-65) for at least one physical parameter for said at least one selected die with data for controlling said subjecting at least one selected

portion of said liquid resin over said active surface of said at least one selected die to a discrete beam of focused radiation (Abstr.).

In view of claim 36, Lake forms stereolithographically a wafer support barrier (Fig. 2 #22) on said platform to horizontally secure the circuit.

In view of claim 37, Lake forms a wafer to said platform and stereo lithographically forming semisolid edge support barrier (Fig. 2 #22) securing an edge of the wafer to said platform.

In view of claim 52, Lake forms a component of a semiconductor device assembly to another component of the semiconductor device assembly (Fig. 1 #18 & #20), comprising: providing the component, the component including at least one support structure on a portion of a surface thereof, said at least one support barrier structure (Fig. 2 #22) comprising a plurality of super-imposed, contiguous, mutually adhered layers of material, at least an outermost layer of said plurality of layers comprising an adhesive material; aligning the component with the another component; and securing the component to the another component with said adhesive material (Fig. 2 #30).

In view of claim 53, Lake forms a comprises providing the component with at least said outer-most layer of said plurality of layers comprising a thermoplastic material (Col. 3 lines 40-60).

In view of claim 54, Lake secures by heating at least portions of said thermoplastic material to at least soften said thermoplastic material (Col. 5 lines 25-45).

In view of claim 55, Lake forms a substantially simultaneously with said heating at least portions of said thermoplastic material, heating at least one conductive structure of at least one of the component and the another component to secure said at least one conductive structure to a contact of the other of the component and the another component (Col. 5 lines 25-45).

In view of claim 56, Lake secures at least one conductive structure (Fig. 2 #16) of at least one of the component (#18) and the another component (#20) to a contact of the other of the component and the another component.


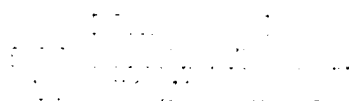
Contact Information

Any inquiry concerning this communication or earlier communications for the examiner should be directed to Granvill Lee whose telephone number is (703) 306-5865. The examiner can be normally reached on Monday thru Thursday from 7:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are not successful, the examiner's supervisor, Matthew Smith can be reached on (703) 308-1323. The fax phone number for this group is (703) 308-7722.

Any inquiry of a general nature relating to status or otherwise should be directed to the receptionist whose telephone number is 703-308-1782.

Examiner
Granvill Lee
Art Unit 2825

GI
11/25/02